BAMBOO BAT AND METHOD OF MANUFACTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to baseball bats, and more particularly, to baseball bats fabricated from bamboo.

2. Prior Art

Presently, bamboo baseball bats employ a traditional technique for their fabrication. Such a traditional technique is shown in Figures 1A and 1B. Figure 1A illustrates a bamboo baseball bat blank 100 and Figure 1B illustrates a sectional view of the blank 100 taken about line 1B-1B in Figure 1A. The blank 100 consists of a plurality of bamboo strips 102, each of which is typically about 10 mm thick by 900 mm long. The bamboo strips 102 are glued together in the same direction (direction A) to form the blank 100, which is typically about 70 mm by 70 mm in cross-section. As shown in Figure 1B, the strips 102 are typically adhered in a staggered pattern. The blank 100 is then processed to form a finished baseball bat. However, this traditional technique results in an unbalanced bamboo bat that has an uneven weight shift within the bat, which makes it prone to breakage.

SUMMARY OF THE INVENTION

Therefore it is an object of the present invention to provide a baseball bat, in particular, a

bamboo baseball bat that overcomes the disadvantages of baseball bats and other types of bamboo bats of the prior art.

Accordingly, a baseball bat is provided. The baseball bat comprising: a core section comprising a plurality of wood strips adhered to each other; and an outer section at least partially surrounding the core section, the outer section comprising a plurality of wood strips adhered to each other and to the central core section, wherein the direction of at least some of the plurality of wood strips comprising the core section are offset from the direction of at least some of the plurality of wood strips comprising the outer section.

In a first configuration, at least one of the plurality of wood strips comprising the core section and the plurality of wood strips comprising the outer section are bamboo.

In another configuration, each of the plurality of wood strips comprising the core section and the plurality of wood strips comprising the outer section are bamboo.

In another configuration, at least some of the plurality of wood strips comprising the core section are bamboo.

In yet another configuration, at least some of the plurality of wood strips comprising the outer section are bamboo.

Preferably, the core section has a cross sectional dimension of about 20 mm by 20 mm.

Preferably, the core section comprises an alternating pattern of the plurality of wood strips. The alternating pattern preferably comprises at least some of the plurality of wood strips arranged in a first direction and at least some of the plurality of wood strips in a direction orthogonal to the first direction. Preferably, the core section comprises four blocks of wood strips, each of the four blocks having two wood strips adhered together, two of the blocks being in the first direction and two of the wood blocks being in the direction orthogonal to the first direction. Each of the plurality of wood strips of the core section preferably have a cross sectional dimension of about 5 mm by 10 mm, each block preferably has a cross sectional dimension of about 10 mm by 10 mm, and the central core section preferably has a cross sectional dimension of about 20 mm by 20 mm.

Preferably, the outer section comprises four subsections, two of the subsections having some of the plurality of wood strips arranged in a first direction and two of the subsections having some of the plurality of wood strips arranged in a direction orthogonal to the first direction.

Also provided is a method for fabricating a blank from which a baseball bat is fabricated. The method comprising: constructing a core section comprising a plurality of wood strips adhered to each other; and constructing an outer section at least partially surrounding the core section, the outer section comprising

a plurality of wood strips adhered to each other and to the central core section, wherein the direction of at least some of the plurality of wood strips comprising the core section are offset from the direction of at least some of the plurality of wood strips comprising the outer section.

Preferably, the constructing of the core section comprises alternating a pattern of the plurality of wood strips. Preferably, the alternating comprises arranging at least some of the plurality of wood strips in a first direction and at least some of the plurality of wood strips in a direction orthogonal to the first direction. The arranging preferably comprises arranging four blocks of wood strips, each of the four blocks having two wood strips adhered together, two of the blocks being in the first direction and two of the blocks being in the direction orthogonal to the first direction.

Preferably, the constructing of the outer section comprises providing four subsections, two of the subsections having some of the plurality of wood strips arranged in a first direction and two of the subsections having some of the plurality of wood strips arranged in a direction orthogonal to the first direction.

Still provided is a method for fabrication of a baseball bat. The method comprising: constructing a blank, wherein the constructing of the blank comprises, constructing a core section comprising a plurality of wood strips adhered to each other and constructing an outer section at least partially surrounding the core section, the outer section comprising a plurality of wood strips adhered to each other and to the central core section,

wherein the direction of at least some of the plurality of wood strips comprising the core section are offset from the direction of at least some of the plurality of wood strips comprising the outer section; and processing the blank into a form of a baseball bat.

The processing preferably comprises shaping the blank into the form of a baseball bat. The processing preferably further comprises polishing the baseball bat resulting from the shaping. The processing also preferably further comprises finishing the baseball bat resulting from the polishing.

Still yet provided is a blank from which a baseball bat is manufactured. The blank comprising: a core section comprising a plurality of wood strips adhered to each other; and an outer section at least partially surrounding the core section, the outer section comprising a plurality of wood strips adhered to each other and to the central core section, wherein the direction of at least some of the plurality of wood strips comprising the core section are offset from the direction of at least some of the plurality of wood strips comprising the outer section.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features, aspects, and advantages of the apparatus and methods of the present invention will become better understood with regard to the following description, appended claims, and accompanying drawings where:

Figure 1A illustrates an isometric view of a blank of the prior art from which a bamboo bat is fabricated.

Figure 1B is a sectional view of the blank of Figure 1A as taken along line 1B-1B in Figure 1A.

Figure 2A is an isometric view of a blank from which a baseball bat is fabricated according to a preferred implementation of the present invention.

Figure 2B is a sectional view of the blank of Figure 2A as taken along line 2B-2B of Figure 2A.

Figure 2C is a detailed sectional view of a central portion of the blank of Figures 2A and 2B.

Figure 3 shows a finished baseball bat manufactured according to methods of the present invention.

Figure 4A illustrates a sectional view of the baseball bat of Figure 3 as taken along line 4A-4A in Figure 3.

Figure 4B illustrates a sectional view of the baseball bat of Figure 3 as taken along line 4B-4B in Figure 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Although this invention is applicable to numerous and various types of woods for use in baseball bats, it has been found particularly useful in the environment of bamboo. Therefore, without limiting the applicability of

the invention to bamboo, the invention will be described in such environment.

Referring now to Figure 2A, therein is shown a preferred implementation of a blank from which is fabricated a baseball bat, the blank being referred to generally by reference numeral 200. The blank 200 having a core section 202 comprising a plurality of wood strips 204 adhered to each other. The blank 200 also comprises an outer section 206 at least partially surrounding the core section 202. The outer section 206 preferably completely surrounds the core section 202 and comprises a plurality of wood strips 208 adhered to each other and to the central core section 202. The direction of at least some of the plurality of wood strips 204 comprising the core section 202 are offset from the direction of at least some of the plurality of wood strips 208 comprising the outer section 206.

As discussed previously, at least one of the plurality of wood strips 204 comprising the core section 202 and/or the plurality of wood strips 208 comprising the outer section 206 are bamboo. However, other typical wood materials known in the art for use in baseball bats are also possible. Thus, each of the plurality of wood strips 204 comprising the core section 202 and the plurality of wood strips 208 comprising the outer section 206 can be bamboo. Alternatively, at least some of the plurality of wood strips 204 comprising the core section 202 can be bamboo and/or at least some of the plurality of wood strips 208 comprising the outer section 206 can be bamboo.

The core section 202 can comprise an alternating pattern of the plurality of wood strips 204. The alternating pattern can comprises at least some of the plurality of wood strips 204 arranged in a first direction A and at least some of the plurality of wood strips 204 in a direction B orthogonal to the first direction A. An example of such a configuration is shown in Figures 2A-2C, in which the core section 202 comprises four blocks 202a of wood strips 204. Each of the four blocks 202a have two wood strips 204 adhered together where two of the blocks 202a are arranged in the first direction A and two of the wood blocks 202a are arranged in the direction B orthogonal to the first direction A. Furthermore, the blocks 202a are arranged such that those arranged in the first direction A abut those blocks 202a arranged in the second direction B and vice versa. Each of the plurality of wood strips 204 of the core section 202 can have a cross sectional dimension of about 5 mm by 10 mm, giving each block 202a a cross sectional dimension of about 10 mm by 10 mm and the central core section 202 a cross sectional dimension of about 20 mm by 20 mm.

The wood strips 208 of the outer section 206 can all be aligned in the same direction, or in a plurality of directions. The outer section 206 can also comprise two or more subsections 206a and 206b. The subsections can be substantially equivalent in terms of configuration and size or they can differ from subsection to subsection. Preferably, the outer section 206 has four subsections 206a, 206b as shown in Figures 2A and 2B. Two of the subsections 206a have some of the plurality of wood strips 208 arranged in a first direction A and two of the

subsections 206b have some of the plurality of wood strips 208 arranged in a direction B orthogonal to the first direction A.

The construction of a finished baseball bat will now be described with reference to Figures 2A-2C and 3, the finished baseball bat being referred to generally by reference number 300.

If bamboo is utilized for at least a portion of the wood strips 204, 208 of the blank 200, it is harvested when approximately four to five years old and when the diameter of the head of the bamboo is approximately 10-12 cm. After being harvested, the bamboo should be processed as discussed below within three days. The harvested bamboo is cut to size depending on the required different lengths and diameters for the particular baseball bat 300 being fabricated. For example, the bamboo can be cut into 3 cm wide strips. Next, the surface of the 3 cm wide bamboo strips are polished and an inner layer of the bamboo are planed with a planer machine. The cut bamboo strip is submerged in oxygenated liquid at 100 degree Celsius and boiled for 3 hours. After boiling, the boiled bamboo strips are transferred into a drying room and dried at 60-70 degrees Celsius for 1-3 days, and 30-40 degrees Celsius for an additional 4 days to keep the moisture content of the bamboo below about 9%. The boiling and drying of the bamboo removes all or most traces of sugar and moisture. Any strips of poor quality or wrong size are eliminated.

The blank 200 is then fabricated from the strips. Each bamboo piece is then cut to 900 mm x 10 mm x 5 mm bamboo strips. These pieces are then glued together with a

heat pressure machine (HPM) to make 900 mm x 10 mm x 10 mm blocks 202a. Four such blocks 202a are glued and compressed together by HPM to fabricate the core section 202 having an approximate dimension of 900 mm x 20 mm x 20 mm. Around these core pieces, more bamboo pieces are glued together with HPM to form the outer section 206, until the new dimensions are 900 mm x 70 mm x 70 mm to form the blank 200. As discussed above, the core section 202 is preferably fabricated from four 10 mm x 10 mm blocks 202a of bamboo or other wood. Two of the blocks 202a are arranged in direction A and two of the blocks 202a are arranged in direction B which is orthogonal to direction A. Each of the blocks 202a are made from two 10 mm x 5 mm wood strips 204 that are adhered together using any industry standard glue known in the art. The blocks 202a are also adhered to each other with industry standard glue as is the wood strips 208 of the outer section 206. An example of such a glue is DYNEA AEROLTE (made in Norway) in which the strips are adhered while heating to 90 degrees Celsius with the HPM for 10 - 50 min depending on the thickness of the bamboo strips being adhered.

The blank 200 is then passed between shaping and polishing stations for rough polishing, fine polishing and very fine polishing to craft the blank 200 into the shape of a baseball bat 300. The baseball bat 300 can be shaped such that the core section 202 and at least a portion of the outer section 206 remain in all cross sections of the baseball bat along its length. Typically, the barrel 302 of the bat 300 has the largest cross section while the handle 304 has the smallest cross section. As can be seen in Figure 4A, a large portion of the outer section 206

remains after shaping of the barrel 302 of the bat. As can be seen in Figure 4B, a smaller portion of the outer section 206 remains after shaping of the handle 304. Since the core section 202 is surrounded by at least a portion of the outer section 206, the resulting baseball bat 300 will be stronger and less prone to breakage than a bat in which only the core section remains after shaping. After shaping and polishing, the baseball bat 300 is finished, preferably with one or more, and preferably two coats of lacquer paint. However, other finishes, such as stains can also be applied to the baseball bat 300.

Those skilled in the art will appreciate that the dimensions for the wood strips 204, 208, for the blocks 202a, 206a, and the overall dimensions of the blank 200 and bat 300 are given by way of example only and not to limit the scope or spirit of the present invention. Those skilled in the art of baseball bat manufacturing will appreciate that bat sizes can differ greatly between bats intended for different age groups and also within any particular age group.

The baseball bats of the present invention enable the bat to have a balanced weight through out its entire length that not only makes the entire bat practically a " sweet-spot", but also makes the bat less prone to breakage.

While there has been shown and described what is considered to be preferred embodiments of the invention, it will, of course, be understood that various modifications and changes in form or detail could readily be made without departing from the spirit of the invention. It is therefore intended that the invention be not limited to the

exact forms described and illustrated, but should be constructed to cover all modifications that may fall within the scope of the appended claims.